DOCUMENT RESUME

ED 148 151 FL 009 114

AUTHOR Homma, Yayoi
TITLE An Acoustic Study of the Vowel Pitch Levels and the "Flat" Type Accent in Kyoto Japanese.
PUB DATE 21 Jun 75
NOTE 10p.; Paper presented at the annual meeting of the Asian Studies on the Pacific Coast (Honolulu, Hawaii, June 1975)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS *Acoustic Phonetics; *Dialect Studies; *Intonation; *Japanese; *Language Research; Language Variation; Phonology; Pronunciation; Regional Dialects; Suprasegmentals; *Vowels
IDENTIFIERS Kyoto Japanese; *Pitch (Language)

ABSTRACT

One characteristic of Japanese pitch accent is that there is the so-called "flat" accent, which has no fall or nucleus. This type of accent exists not only in Standard Japanese but in many dialects, including Kyoto. But the flat types are different in the Tokyo and Kyoto dialects. In the Tokyo dialect, the first syllable always has a low tone and the second a high tone. In the Kyoto flat type, the first and second syllables have the same high tones. Acoustic measurements were made on 144 di-syllabic Kyoto-accented words with the help of a Honeywell 906 C Visicorder. The results indicate that: (1) there are three vowel pitch levels--high, mid and low, but the mid tone linguistically loses its "raison d'etre" because it appears in the flat type or before a high tone, and it does not have any relationship with the nucleus; and (2) the flat type is acoustically unstable in pitch and amplitude. This instability may be one of the reasons why the historical changes in Japanese accent are more conspicuous in the flat type than in the non-flat types. (Author/KM)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Yayoi Homma
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

ED148151

An Acoustic Study of the Vowel Pitch Levels and the 'Flat' Type Accent in Kyoto Japanese*

Yayoi Homma
Osaka Gakuin University, Osaka, Japan

1. Introduction

It is well known that there have been different theories on Japanese pitch accent among Japanese linguists. One of them is the 'Old Two-Step' theory advocated by Bimyosai Yamada and E. D. Polivanov, a Russian linguist. Next comes the 'Three-Step' theory by Kanae Sakuma, Kyosuke Kindaichi and many other linguists. A third is the 'New Two-Step' theory by Tatsuro Yatabe, Koichi Miyata and others. Both the 'Two-Step' theorists claim two linguistic pitch levels -- high and low, while the 'Three-Step' theorists three pitch levels -- high, mid and low.[1] Shiro Hattori, on the other hand, criticizes these three groups of 'Step' theories and says that these three theories are not phonemic, but phonetic interpretations. He puts emphasis on the relationship between the last high tone and the following low tone and calls it 'the Accent Nucleus,' or 'the Fall.'[2] According to him. "the nucleus is higher and stronger than the following mora."[3]

This nucleus, however, does not appear in the so-called flat type accent which exists not only in the Tokyo dialect but in many other dialects including Kyoto. This absence of the nucleus is said to be one of the characteristics of Japanese pitch accent, but the flat type accents in the Tokyo and Kyoto dialects are different from each other. In the Tokyo

dialect, the first syllable or mora always has a low tone and the second one a high tone, as seen in "mìzú" (water), "sàkúrá" (a cherry tree), when pronounced separately. In the Kyoto flat type, the first and second moras have the same high tones: "mízú," "sákúrá."

In this paper I want to report acoustic measurements made on 144 dissyllabic Kyoto-accented words and investigate the actual state of the vowel pitch levels and the flat type accent in Kyoto Japanese from which the Tokyo dialect was derived.

2. Procedures

The data presented here were obtained, using my voice (female), with the help of a Honeywell 906 C Visicorder in the Phonetic Laboratory of Indiana University.

The words I chose were 154 dissyllables with the same phonemes but different types of accent, such as /hánà/ (flower) and /háná/ (nose); or /hási/ (bridge), /hási/ (edge), /hàsí/ (chopstick). High tones are shown by ´ above the vowel or 'H'; mid by ' or 'M'; low by ` or 'L'; high-low by 'H-L'; high-high by 'H-H'; low-high by 'L-H'; and monosyllables with a high to low fall are shown by ^ or 'HL'.

The dissyllables of the Kyoto dialect have four types of pitch accent: No. 1 H-L, No. 2 H-H, No. 3 L-H, and No. 4 L-HL, in which the second syllable has a high to low fall like /àsâ/ (morning) and /àmê/ (rain). The Tokyo dialect has three types: No. 1 H-L, No. 2 L-H-(L), and No. 3 L-H-(H). As is known, Tokyo No. 2 and No. 3 are differentiated by the following tones.

For example:

No. 2: hàná gà (flower), L-H-(L)

No. 3: hàná gá (nose), L-H-(H)

In No. 2 L-H, the nucleus comes after the word, so the case-marker ga starts with a low tone. But in No. 3, since there is no nucleus at all after the word, no falling occurs between na and ga.

In the Kyoto dialect, the flat type is No. 2 H-H. Some linguists as Shiro Hattori include, in addition to No. 2, No. 3 L-H in the flat type because of the absence of the nucleus within or after the word.[4] The difference between Kyoto L-H and Tokyo L-H is obvious. As the following examples show, Kyoto L-H has the nucleus just before the word, so it always starts with a low tone even if it comes after a high tone in connected speech. Moreover, if a particle follows it, the tone will be changed from L-H to L-L. It is reasonable, therefore, that some linguists call this type 'flat.' On the other hand, Tokyo L-H becomes H-H after a high tone because of the lack of the nucleus.

Examples:

Kyoto L-H: ùmí (sea) -- kónó ùmì wà (this sea): H-H-L-L-(L)

Tokyo L-H: ùsí (cow) -- kònó úsí wá (this cow): L-H-H-H-(H)

Kyoto H-H: mízú (water)-kónó mízú wá(this water):H-H-H-H-(H)

Kyótò nò mìzù wà: H-L-L-L-L-(L)

The number of words chosen for each group was No. 1, 63 words; No. 2, 42; No. 3, 33; and No. 4, 16. Devoicing occurred on ten words with the high vowels /i/ or /u/ preceded and followed by voiceless consonants, and measurements were done

with the 144 dissyllables.

3. Results and discussions

3. 1. The vowel pitch levels

Table 1 shows the average fundamental frequencies. The differences in cps of V_1 and V_2 are shown with + or - in the last column.

	V_1	V_2	difference $V_1 - V_2$
H-L	325.9	225.9	+100.0
H-H	299.0	277.3	+ 21.7
L-H	243.9	268.2	- 24.3
L-$\hat{HL}$	260.7	H 302.8 L 207.0	- 42.1

Table 1. Average Fundamental Frequencies (cps)

Fig. 1 is a graphic representation of distribution of the vowel pitches. V_1: ■ , V_2: ▨

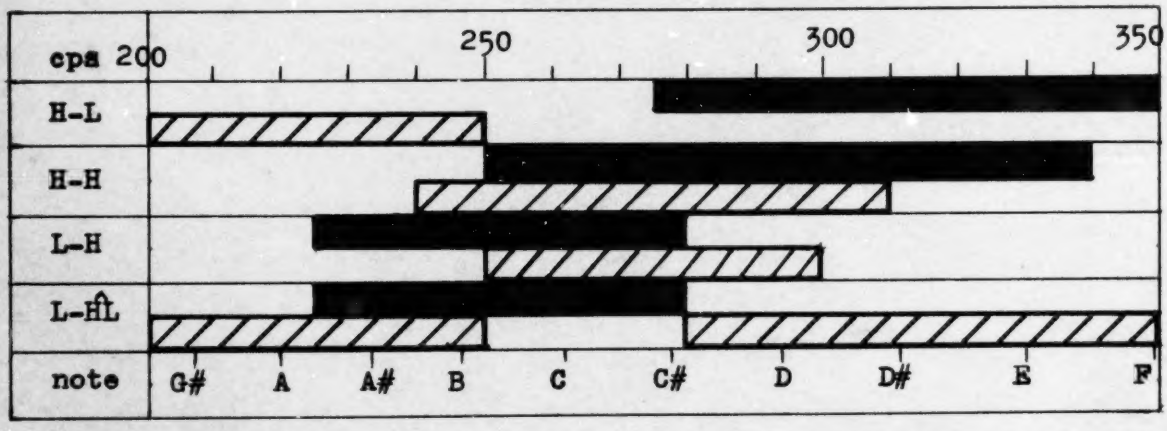

Fig. 1. Graphic Representation of Vowel Pitch

As shown in Fig. 1, there are actually three vowel pitch levels -- high, mid and low. High tones of the flat types, H-H and L-H, are relatively lower than the other high tones which are the nucleus of the words. A low tone before H is higher than L after H. Therefore L of L-H and the first L of L-$\hat{HL}$ are phonetically mid.

3. 2. The flat type accent

In my former paper, "An Acoustic Study of Japanese Vowels -- Their Quality, Pitch, Amplitude and Duration," published in Study of Sounds XVI (1973),[5] I pointed out that "there is an interrelationship between fundamental frequency and amplitude, but the relationship is sometimes broken when the fundamental frequencies of V_1 and V_2 differ a little." It is in these flat types that the difference of V_1 and V_2 is relatively small. The following is the percentage of the break which occurred in each group.

H-L: 15%, H-H: 30%, L-H: 42%, L-$\hat{HL}$: 21%

This demonstrates the fact that the flat type vowels are more or less unstable. Besides, in connected speech the pitch levels of the flat types in both the Tokyo and Kyoto accents fluctuate up or down. This instability may be one of the reasons why the historical changes in Japanese pitch accent are more conspicuous in the flat types than in the non-flat types.

3. 3. The historical changes in Japanese pitch accent

Fig. 2 is a comparison of old Kyoto accent in the Heian Period (794-1192), modern Kyoto accent, and modern Tokyo accent. Old Kyoto accent in Fig. 2 has been borrowed from Haruhiko Kindaichi's Studies on Japanese Phonology,[6] and the dissyllables

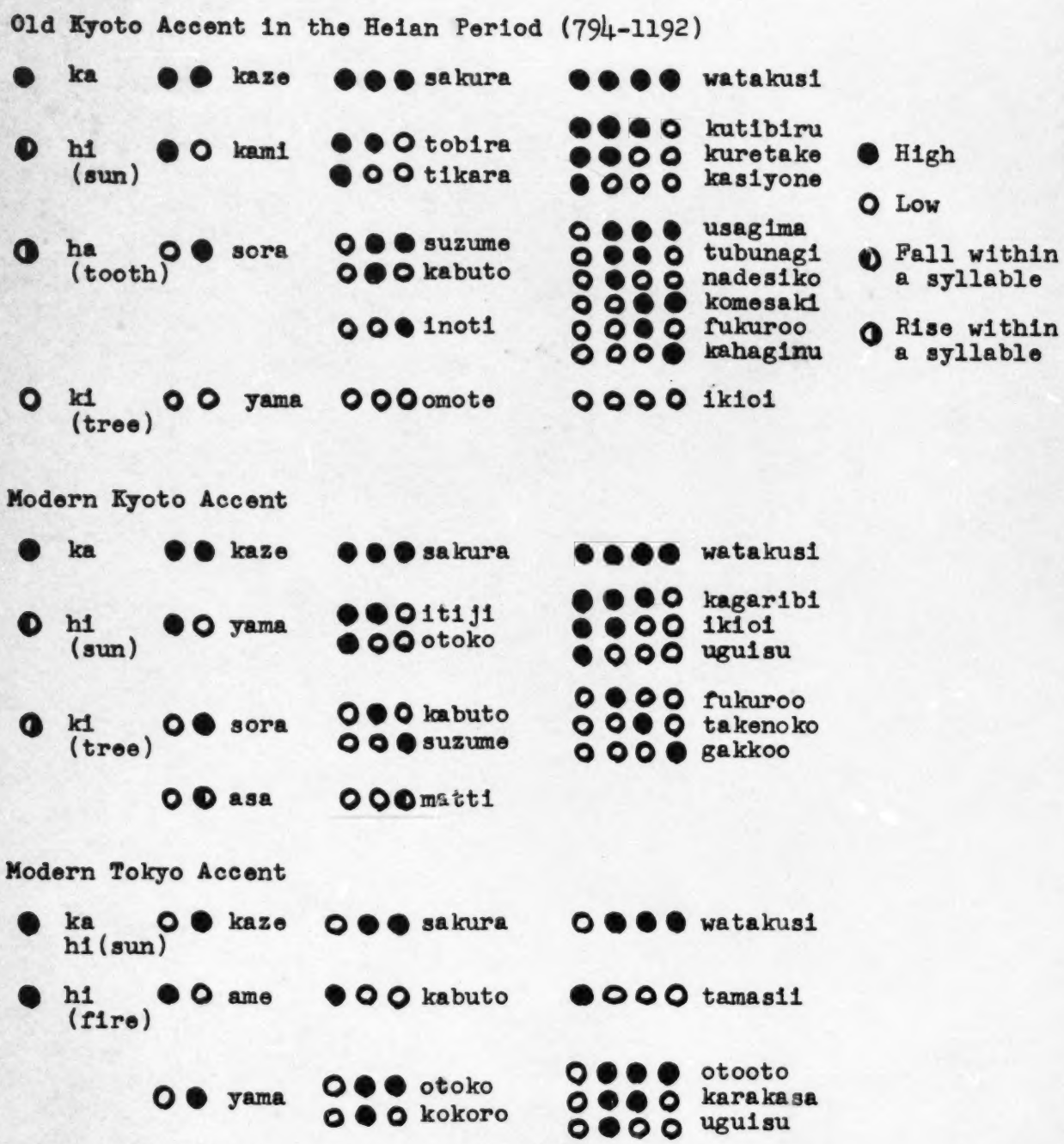

Fig. 2. A Comparison of Old Kyoto Accent, Modern Kyoto Accent, and Modern Tokyo Accent

have four types here. But in another book, The History of the Japanese Language Vol. 5 (Heibonsha, 1966), five more types of accent are given to the dissyllables, which include falling or rising within a syllable:[7]

The characteristics of old Kyoto accent may be said briefly to be (1) the existence of the low flat type as well as the high flat, and (2) more variety of the combination of a high tone and a low tone.

In modern Kyoto accent, the low flat type is completely missing and the number of the accent types has been reduced. In modern Tokyo accent, the types are fewer and V_1 and V_2 always have different tones. Thus the Tokyo flat is no longer H-H, but it is L-H. Besides, falling or rising within a syllable has disappeared and the fall comes between syllables. The low tone of V_1 in the Kyoto accent is meaningful, because it implicates the nucleus preceding it, but not in the Tokyo accent, and it is neutralized in connected speech.

4. Conclusion

It is said that Japanese accent has gradually lost the influence of the Chinese language, which has the four distinctive tones: No. 1: high-level, No. 2: high-rising, No. 3: low-dipping, and No. 4: high-falling. The system of Japanese accent has become more and more simplified, and the accent nucleus is more important than the combination of tones, especially in the Tokyo dialect. As mentioned above, the nucleus is said to be "higher and stronger than the

following mora," and the experiments show that the flat type which has no nucleus is acoustically unstable in pitch and amplitude. It is natural that the flat type should be exposed to danger of change or disappearance. In fact, the low flat type in the Heian Period has been lost and the Tokyo flat type is no longer flat in the true sense of the word. Some linguists anticipate that Japanese accent will lose the flat type in the future and approach the Greek type accent which has the nucleus in every word.

I may conclude thereby that (1) there are phonetically three vowel pitch levels -- high, mid and low -- in modern Kyoto Japanese, but the mid tone may lose its raison d'être from a linguistic point of view, because it appears in the flat type or before a high tone, and it does not have any relationship with the nucleus, and that (2) the flat type accent has been subject to and will be subject to more marked changes than the non-flat types in Japanese pitch accent because of the lack of the accent nucleus.

Notes

* This paper was presented at the annual meeting of the Asian Studies on the Pacific Coast, Honolulu, 1975. I am grateful to Dr. Jang H. Koo, Chairman, and Dr. David Ashworth, Discussant, for their valuable suggestions and comments.

1. For details, see Kindaichi, Haruhiko, Nippongo Onin no Kenkyu (Studies on Japanese Phonology), (Tokyo: Tokyodo Co., 1970), pp. 269-272; Kiyose, G. N., "Accent Change in Pitch-Group in Japanese," The Bulletin of the Phonetic Society of Japan, (1974), 146:1-6.

2. Hattori, Shiro, Onseigaku (Phonetics), (Tokyo: Iwanamishoten Co., 1968), p. 193.

3. Ichikawa, Sanki and Hattori, Shiro, An Introduction to the Languages of the World, Vol. II, (Tokyo: Kenkyusha Co., 1971), p. 157.

4. Ibid., p. 158.

5. Homma, Yayoi, "An Acoustic Study of Japanese Vowels -- Their Quality, Pitch, Amplitude and Duration," Study of Sounds XVI, (Tokyo: Phonetic Society of Japan, 1973), p. 365.

6. Kindaichi, Haruhiko, op. cit., p. 220.

7. Heibonsha, Nippongo no Rekishi (The History of the Japanese Language), Vol. 5, (Tokyo: Heibonsha Co., 1966), pp. 128-9.